

ICE

15¢

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

AUG 17 1933

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



AUGUST 12, 1933

Continental Lighthouse

See Page 109

A

SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXIV

No. 644

The Weekly Current
Summary of Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

Board of Trustees of Science Service

Honorary President, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, President, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, W. H. Howell, Vice-President and Chairman of Executive Committee, National Research Council, Washington, D. C.; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; David White, Senior Geologist, U. S. Geological Survey, Representing National Research Council, Vernon Kellogg, Secretary Emeritus, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithton, Treasurer, Cincinnati, Ohio; Robert F. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

Staff of Science Service

Director, Watson Davis, Staff writers: Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, J. W. Young; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Copyright 1933, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will gladly be sent on request.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of \$3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Sciserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Offices.



DO YOU KNOW?

Whales are fully grown at six to eight years, though they may live to the ripe old age of 20 years.

The disease beri-beri, caused by deficiencies in diet, is the cause of 17,000 deaths in Japan each year.

A scientist in a zoological laboratory reports seeing a cottonmouth moccasin bite a rattlesnake, and says that the rattler died three days later.

Ninety-two per cent. of the world's big cities—with over 100,000 population—are in the northern hemisphere.

In the ninth century, the Emperor Charlemagne commanded his people to grow certain herbs and vegetables in their gardens.

Diseases of ductless glands sometimes cause the bones to soften, and one such case is reported of a man who broke his leg while sneezing.

It is reported that an enamel made of rubber is being developed as a protective coating for the under side of airplane wings.

A record-breaking black bear killed in Pennsylvania last year weighed about 650 pounds when alive.

The markets of the Emperor Trajan, recently unearthed in Rome, will be the scene of an Italian government poultry show this autumn.

Poison ivy is so very poisonous that a doctor found that one-sixty-thousandth of a grain dissolved in olive oil and rubbed on the skin would cause mild poisoning.

Statisticians find that the death rate from accidents in the home is declining so far as children are concerned, but is steadily rising for adults.

Golden snow, seen on the mountains of Glacier National Park in late winter, is due to tiny yellow insects which blanket the snow for a brief time.

Tapeworms from Baltic Sea countries are reported to have spread to the Great Lakes region, where they infest the fish, and endanger human beings who eat the infested fish raw or inadequately cooked.

WITH THE SCIENCES THIS WEEK

AERONAUTICS

Why does sky-writing not smear 20,000 feet up? p. 101.

ANTHROPOLOGY

How is the existence of a new racial type in America to be proved or disproved? p. 99.

ASTRONOMY

At what height are falling stars brightest? p. 104.

BIOLOGY

Can doped clams be restored? p. 105.

CHEMISTRY

What method of heating does the blast furnace replace in the production of phosphoric acid? p. 99.

Who has developed a cheaper method of zinc plating? p. 107.

ENGINEERING

How much energy used by the world is human energy? p. 108.

What is remarkable about the new U. S. submarine *Cachalot*? p. 111.

When were intracoastal waters of the Atlantic seaboard last surveyed? p. 110.

Where is sea wall design being studied in miniature? p. 101.

Why have rivets been used hot? p. 105.

ENTOMOLOGY

From what distance will an artificial love potion attract gipsy moths? p. 105. *The Insect Menace*—L. O. Howard—*Century*, 1931, \$3.00.

How small is the chalcis fly? p. 111.

EXPLORATION

Where are the Tristan da Cunha islands? p. 108.

FORESTRY

Do forests and brush "conserve the water supply"? p. 107.

How many tank-truck fire-fighting units are in California? p. 111.

HYGIENE

What relieves heat cramps in miners? p. 106. *Why the Weather*—C. F. Brooks—*Harcourt Brace*, 1924, \$2.

ICHTHYOLOGY

What fish "walks on its tail"? p. 100.

MEDICINE

At what age is stomach acidity most common? p. 109.

How does removal of the thyroid gland relieve an overworked heart? p. 101.

What is the "artificial heart" for use in blood transfusions? p. 105.

PHYSICS

Ions of what element were used in the production of positive X-rays? p. 99. *X-Ray Technology*—H. M. Tervill and C. T. Ulrey—*Van Nostrand*, 1930, \$4.50.

PLANT PATHOLOGY

How may Dutch elm disease be detected? p. 104.

PSYCHOLOGY

Do neurotic tendencies affect success? p. 100. *How and Why of Human Behavior*—George A. Dorsey—*Harper*, 1929, \$3.50.

SEISMOLOGY

How much was a Los Angeles street widened by the March 10 earthquake? p. 104.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Book Dept., *Science News Letter*, at publishers' prices, prepaid in the United States.

PHYSICS

Fast-Moving Positive Particles Produce New Kind of X-Rays

But Positive Ions Driven By Million Volts Yield Radiation Comparable Only With 10,000-Volt Negative X-Rays

POSITIVE X-rays can now be produced at a million volts instead of the few thousand necessary for ordinary or "negative" X-rays.

Positive X-rays are produced in a vacuum by the impact of positively charged ions, or atoms that have lost an electron, on a metal target; whereas negative X-rays, found by Roentgen in 1895, are produced by fast electrons.

Dr. W. M. Coates and Prof. E. O. Lawrence of the University of California have stepped up mercury positive ions to 1,000,000 volts and on allowing them to strike targets of various elements have observed that real X-rays are given off.

Ever since Roentgen's original discovery of the common "negative" X-ray that has played such an important part in modern medicine, physicists have been attempting to produce these rays by positive as well as negative projectiles. Sir J. J. Thomson, as early as 1914, observed a non-penetrating radiation from targets struck by protons or hydrogen positive ions, but the very softness or lack of penetrating power of the radiation proved that this was not a positive X-ray.

Even Drs. J. D. Cockcroft and E. T. S. Walton of Cambridge University, the pioneers in nuclear disintegration by high velocity protons, found no appreciable quantity of this positive X-radiation at projectile speeds equivalent to 700,000 volts. It remained for F. L. Verwiebe of the University of Chicago to settle the question as to the exact nature of the Thomson radiation resulting from proton bombardment.

At energies up to 50,000 volts he found that the hardest radiation given off was not due to the metal being used as a target but to the changes in the bullets themselves at the time of the impact. This is to be contrasted with the effects of Drs. Coates and Lawrence where the radiation has without doubt the same penetrating power as our ordinary X-rays, and where, from targets of the lighter elements the rays are characteristic of the targets, a true X-ray ef-

fect. However, for the heavier targets it is again the bullet itself that breaks up.

At present there are no prospects of utilizing this new method to produce better or cheaper X-rays. The process is remarkably inefficient as a million volt positive ion will produce only approximately the same quantity of X-rays as a ten thousand volt electron.

The scientific solution of the old problem as to the previous non-existence of positive X-rays is twofold: higher voltages and heavier projectiles.

Science News Letter, August 12, 1933

ANTHROPOLOGY

Exposition Visitors Examined For New Racial Type

HAS A NEW racial type been smelted into being out of the quality, mediocrity and dross poured into the American melting pot?

This is the question that visitors from all parts of the United States are helping the Harvard anthropometric laboratory answer at its station on the grounds of the Century of Progress Exposition.

As the visitors file through the station, in charge of C. Wesley Dupertuis, more than ninety measurements and observations of physical characteristics are

CHEMISTRY

Blast Furnace Gets Phosphorus Cheaply From Tennessee Rock

PHOSPHORIC acid of a higher purity than ever obtained before can now be produced economically in large quantities by means of a process perfected by Henry W. Easterwood, chemical engineer, and his associates. This acid, indispensable in the manufacture of certain fertilizers, foods, and drugs, is obtained from phosphate rock which occurs in large quantities in Tennessee.



MELTING POT TEST

made. Thus a cross section of American racial types is being charted which is expected to determine for the first time whether there is a distinct American racial type and, if so, what its characteristics are.

From data already taken it appears that Americans are revealing a common racial type which is becoming more and more round-headed instead of Nordic long-headed.

Science News Letter, August 12, 1933

Although it has been the desire of chemical engineers for sixty-five years to be able to manufacture phosphoric acid cheaply, it remained for Mr. Easterwood and his associates successfully to adapt the blast furnace principle to the problem and make the dream a reality. As a result a furnace capable of producing 250,000 pounds of phosphorus pentoxide per day, which is converted

directly into acid in the process, has been put into operation at Nashville.

The use of the blast furnace was first suggested in 1868 but was deemed commercially impracticable at that time. Hence for thirty or forty years the manufacture of phosphoric acid was carried out in the electric furnace.

In 1917, the Bureau of Soils of the Department of Agriculture became interested in the subject because of the desire for producing a concentrated phosphate fertilizer. The Bureau went on the theory that ordinary silica sand heated to a high temperature in the presence of carbon was capable of expelling phosphorus from the rock. An oil fired furnace gave promising results and inspired chemists to work toward the development of the present blast furnace burning coke under an enforced air blast.

Several furnaces were built by Mr. Easterwood and his associates before the ninety-five foot monster at Nashville came into being. Many difficulties had to be overcome of both a chemical and engineering nature. As finally developed the process consists of burning briquettes composed of phosphate rock, silica sand, and coke to phosphorus pentoxide and treating the product with water to form the phosphoric acid.

The acid, because of its chemical properties, must be shipped in rubber lined cars. The last step is its conversion into phosphate compounds for fertilizers, food purifiers, and drugs.

Science News Letter, August 12, 1933

ICHTHYOLOGY

Fish Spins on Tail Over Sea Surface

A FISH that seems to walk on its tail is one of the new mounted specimens on exhibition at the Philadelphia Academy of Natural Sciences. It is a ribbon bill fish that can spin along upright on the surface of the sea for several hundred yards and thus appears to be walking on its tail.

This fish is the "whippet" of the so-called "hound" fishes—a long, thin creature that spends its life on or near the surface of the sea, skimming along at a rapid pace and every once in a while "walking" as above mentioned. It is not far removed from flying fishes, which appear to use their fins as wings and present a most beautiful sight when seen in large numbers in tropic waters.

Science News Letter, August 12, 1933

PSYCHOLOGY

Unpredictable Human Factor Attacked by Psychologists

300 Studies Reviewed by Dr. Watson Begin to Penetrate Mystery of Man Which Obscures Events of the Future

THE SUCCESS or failure of NIRA, as well as the other magnificent or trivial projects of mankind, depends in the last analysis upon the nature of man himself. The human factor, most unpredictable of all elements, enters inevitably into all calculations for the future of civilization.

The integrity of individual bank officials has a most far-reaching effect upon the credit relations and business of the nation. The courage, honor, decisiveness, and leadership of public officials are basic to good government. The cooperation, self-reliance, optimism, persistence, and industry of John Doe are essential to democracy.

Man a Mystery

Yet man still remains a mystery. Shall we depend on Smith to run the Chicago office for us? Can Brown be relied on to make good his note? Is Jones lying when he says he will renew the contract? The man who knows the answers to such questions has a great advantage.

Scientists are now prolific in research to provide tools for measuring the hearts of men. Dr. Goodwin Watson of Columbia University, reviews in the *Psychological Bulletin* more than 300 studies which psychologists have published on this subject during the past two years.

Rating scales and "behaviorgrams" for measuring reputation, which is the outward sign of personality, have received a generous share of attention. Studies of neurotic tendencies reveal the fact that this abnormality so common to man has no apparent relation to school success, professional success, ability in art, or pacifistic attitudes.

Priests in training in a Catholic seminary were found to have the introvert's personality, centered within the self rather than on the outside world. Like neurotic tendencies, introversion tests are remarkable for their lack of relation to other factors of personality. The recent studies show that they have no signifi-

cant relation to art ability, hypnotizability, choice of friends, social adjustment, susceptibility to caffeine, delinquency, or school grades. The notion that the introvert is more studious but cannot get along with other people thus topples.

One psychologist has made a study of human happiness and has found that among 500 young men, the happier were easier in mood, in better health, better adjusted sexually, more sociable, more interested in religion, more approving of their work and work associates. Others found that job insecurity and disagreeable supervisors were the main thorns in the work situation.

Moral knowledge was found not a function of age, and the traditional finding was confirmed that there is no relation between moral knowledge and delinquency.

Scales have been devised for measuring the attitudes of individuals and groups toward all sorts of matters, including God, the law, capital punishment, foreign nationalities and races, prohibition, Communism and birth control. The movies serve to change these attitudes, it was found.

Individual Character

One psychologist has attempted an analysis of human relationships as displayed when a number of persons co-operate in a common task.

"The promising feature of our present situation is the attention being given to the careful observation of conduct in more or less controlled situations," comments Dr. Watson. "Ratings come to be more and more observations of actual behavior and less and less based upon imaginary traits. . . . There is a slight increase, although not yet approaching the most desirable point, of studies in which groups of persons are examined in their interrelationship, recognizing that character does not exist in isolated individuals, but is a function of a social situation having a certain structure."

Science News Letter, August 12, 1933



ROARING NORTHEASTER

MEDICINE

Thyroid Removal Gives Relief To Heart Disease Sufferers

COMPLETE removal of the normal thyroid gland is a new method used by a group of physicians and surgeons in Boston to relieve certain types of heart disease. In eleven of thirteen cases the results so far have been successful.

The method has been used in cases of congestive heart failure and dreaded angina pectoris. It was devised by Drs. H. L. Blumgart, S. A. Levine, and D. D. Berlin of Boston, Mass. The theory of the operation is to lessen the load of the overworked heart or weakened arteries in pumping and carrying the mass of blood to the tissues. The amount of work the heart must do depends primarily on the call of the tissues all over the body for oxygen. This in turn is governed by the thyroid gland which determines the rate at which body processes requiring oxygen go on.

Partial removal of the thyroid has helped patients suffering from heart disease due to thyroid disorder. The Boston investigators argued that removal of the gland should also be helpful to patients whose hearts were overworked or strained from other causes. But in order to get permanent relief, the entire gland must be removed, for if any is left it will enlarge and proceed again to speed up the metabolic rate and increase the heart's work.

Complete removal of the thyroid gland is an exceedingly delicate opera-

tion, points out Dr. J. H. Means in an editorial comment on the new method in the *Annals of Internal Medicine*. Dr. Berlin has devised a successful and safe method but Dr. Means warns that only surgeons who have given it special study should undertake this operation.

After the operation, the patients must be given small doses of thyroid regularly to prevent development of serious symptoms of thyroid deficiency, such as gross overweight and sluggishness of mind and body. However, this dosage may be nicely adjusted so as to avoid development of this condition at the same time that the heart is spared from much of its load of work.

Science News Letter, August 12, 1933

ENGINEERING

Synthetic Waves May Tell How To Save Coasts

WITH SYNTHETIC storms created in a miniature ocean contained in a concrete tank, Prof. Kenneth C. Reynolds of the Massachusetts Institute of Technology hopes soon to be able to tell how to design sea walls that will hold real storm waves at bay and prevent millions of dollars of damage to waterfront property.

The Institute's laboratory ocean, believed to be the first of its kind, is 20

feet long and 6 feet wide. A wedge-shaped plunger moving up and down at one end creates the miniature waves. From the moment they start rolling shoreward to break upon a sandy beach and hurl themselves against the tiny seawall, their behavior is observed. As they break against the seawall and toss spray several feet high, which is equivalent to from 25 to 60 feet in the majestic scale of nature, they carry sand and pebbles beyond the wall just as the sea does on innumerable Atlantic seaboard beaches.

The experiment continues for a time and then the amount of sand which has been carried over can be measured. With the same storm conditions a different height of wall or a change in shape of the face may be tried until the best design for a given beach section can be obtained. Waves from various directions and for different high tides will be imitated so as to thoroughly investigate the entire subject.

In the tests thus far made, the sand often has become undermined near the wall just as it does in nature. Methods for remedying this are to be investigated as well as the effect of breakwaters or other forms of offshore protection.

The best design in the miniature having been found, the results will be transferred to nature, thus eliminating the great waste now involved in trying out and altering this or that expensive scheme.

Science News Letter, August 12, 1933

AERONAUTICS

British Sky-Writing Done With Frozen Smoke

SKY-WRITING at 20,000 feet with frozen smoke is the latest advertising scheme in England.

Powerful airplanes having a high ceiling and a fairly high speed will write at twice the former height, almost out of the region of "bumps" and cross currents which previously caused the message to be smeared before it could be completed.

At this altitude it will be necessary for the pilots to wear electrically heated flying suits but it is these low temperatures that will improve the clarity of the message by half-freezing the smoke.

At night the advertising will be continued by means of huge searchlights mounted on tall buildings which will project colored patterns against the clouds above.

Science News Letter, August 12, 1933

Plants That Devour Animals

None Are Man-Eaters, But Many That Gobble Up Insects May Be Found From Remote Lands to Our Own Dooryards

By DR. FRANK THONE

WHEN AN ANIMAL bites a plant, that is hardly to be rated as news. Animals are doing that all the time: cows and caterpillars, mice and men; they'd die very soon if they didn't.

But when a plant bites an animal, reversing the traditional relations of devourer and devoured, there may be an interesting story in it. There are, indeed, a great many interesting stories that might be told of plants that eat animals, in spite of the fact that there are not many such plants, and that the most widespread and sensational of such stories aren't so.

Some of these carnivorous vegetables live in the tropics, or in those strange remote lands "down under," Australia and South Africa. But there are many of them almost in our own dooryards, which any of us can see at the expense of a longer or shorter auto trip. A longer or shorter trip brings us to them, but we may have to risk a pair of wet feet to make their close acquaintance. For some of them live in the water, and the rest, without exception, live in bogs.

That is the secret of the strange bloodthirsty habits of these plants—bog water. Bog water is acid, and for some reason not yet well understood acid water prevents plant roots from getting the nitrogen which all plants must have.

Now, one of the principal constituents of animal flesh is this same nitrogen. It is primarily to get it that we ourselves eat meat and eggs and cheese, and it is to get nitrogen that some of the nitrogen-starved plants of bogs and acid ponds have developed their weird uncanny ability to capture and digest insects and other creeping and swimming things.

Many scientists, including the famous Charles Darwin, have given these plants their attention. The latest effort has been on the part of Prof. F. E. Lloyd of McGill University in Montreal, who recently summed up all the modern advances in our knowledge of carnivorous plants.

In his survey of the world for plants

that eat animals, Prof. Lloyd found some 440 species, belonging to sixteen genera and grouped into five plant families.

Prof. Lloyd classified all carnivorous plants into two main groups, passive traps and active traps. The passive traps catch their prey either by secreting sticky substances that act like fly-paper or by arranging pits into which the insects tumble and cannot get out of again. There are three types of active traps: plants that add aggressive movement to the fly-paper arrangement of the first type of passive traps, plants that snap shut on their prey like steel-traps, and plants that cage their prey like mouse-traps.

Of the first of these five kinds of insect traps there are no examples easily reached in this country; and they are in any case the least interesting of the insect traps.

Pitcher-Plants Pitfalls

The second type, however, the pitfall trap, is exceedingly common in some parts of the United States and Canada; and it is, moreover, the largest and most conspicuous of all the carnivorous plants. Plants belonging to this class are mostly to be found in the various genera of pitcher-plants. Pitcher-plants grow abundantly in bogs and other acid habitats.

The most striking thing about them, even to the casual observer, is the structure of their leaves. These are hollowed into graceful vase-shaped "pitchers," with a projecting flap down one side to take the place of the handle. The northern pitcher-plants are mostly purple-colored, while the slenderer species that grows on wet parts of the sandy coastal plain of the South has pitchers of a yellowish green.

Either kind, however, is sure perdition to any insect that gets in. On the upstanding "lip" of the pitcher, and again around a zone within, there are multitudes of down-pointing bristles, against which no insect could possibly climb. Below that is an area without bristles, but too smooth for frantic insect feet to clutch. Below this again, near

the bottom of the pitcher, is another bristle-set zone. Is it any wonder that no insect that once begins the descent to this Avernus ever retraces its luckless steps?

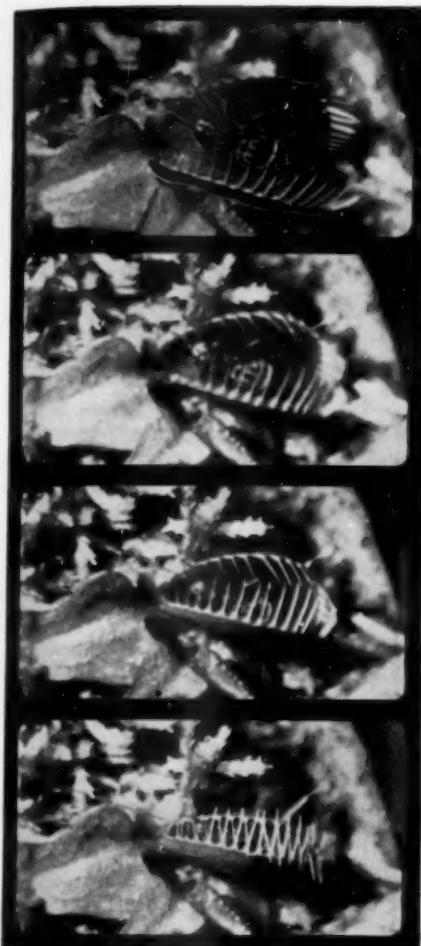
To make the trap the more attractive, near the rim are many glands that secrete nectar, like that of a flower, a stuff of which insects are notoriously fond.

More sinister is the purpose of other glands, found abundantly farther down the pitcher. They secrete a ferment or enzyme which digests flesh just as the pepsin of our own stomachs does. In fact, all the carnivorous plants which have been closely investigated have glands of this character somewhere on their trap surfaces, usually where they will discharge their secretion near the body of a victim. And most of them also have thin places in their surface tissues, through which the digested proteins, reduced to liquid form, can be absorbed.

There are pitcher-plants in other parts of the world, some of them most strange in their structure. Oddest of all, possibly, is the East Indian species known as *Nepenthes*, which has a cluster of sword-shaped leaves running out into slender tendrils, and bearing the pitchers on the ends of these tendrils! The whole thing has the look of an artist's drawing of a completely impossible plant, made real as though to prove that nothing is impossible.

Even more widespread than the pitcher-plants are the sundews. They grow on wet soil almost all over the world, wherever the chemical reaction is acid enough. But we are not nearly so likely to notice them, because most of them are quite tiny plants—seldom more than a couple of inches across the whole rosette of their tiny leaves, or more than that high to the top of their little spire of flowers. But they make up in numbers for what they lack in individual size, for in many places they fairly carpet the ground.

Their leaves are either round or paddle-shaped, and each leaf has a fringe of projecting little fingers around its edge, and similar fingers all over its surface. Each of these tiny fingers ends in a gland that secretes a sticky stuff that holds any gnat or other tiny insect that touches it as tanglefoot fly-paper holds a fly. But the action of the sundew trap



THE FLYTRAP CLOSES

is not the merely passive action of flypaper. When one or more of its sticky-tipped fingers catches an insect, the insect naturally struggles. Then other fingers in the neighborhood, stimulated by the moverment, slowly bend in its direction, and each sets its sticky tip on the luckless victim, pinning him yet more firmly. Half the fingers of a sundew leaf may thus take part in holding an insect, while the other half reach out hopefully for other prey. In some species the whole leaf may curl over, enwrapping the capture.

Bug Becomes Butterwort

A more primitive leaf of the same general character is that of the butterwort, or *Pinguicula*, also a widely distributed carnivorous plant. This is a much larger plant, reaching the size of a small dandelion or violet cluster. Its leaves are thickish, narrowly triangular affairs, without the sundew's fingers, but with a sticky, glossy surface all over their upper side, and with inrolled edges. When a butterwort leaf catches an insect, these edges tend to roll in-

ward yet more closely, preventing escape. In the meantime the digestive glands get to work, and soon the bug is butterwort.

Perhaps the most famous of all the carnivorous plants is the one with the narrowest geographical range. This is the Venus' flytrap, which is found only in a limited area of the coastal plain of the Carolinas, principally around the city of Wilmington, N. C. The leaves of this plant are perfect counterparts of the steel-traps used by fur trappers of the North. Each is divided at its outer end into a pair of semicircular, bristle-edged flaps that hinge along the midrib and can close together in as little time as half a second. Each of these flaps has three bristles on its surface, which are the triggers of the trap.

When an insect alights on a leaf, or a caterpillar crawls up along the stem, it cannot avoid touching these trigger-bristles. When it touches the first one, nothing happens. But a second or so later it touches another. The two stimuli, following one on the other within a stated time, trip the internal mechanism, whatever it may be, and the two halves fly together. The bristles on the outer edges interlock like the teeth of an alligator, so that there is no chance for even a small insect to crawl out. And then the two halves of the leaf, at first concave with a little space between them, press together tightly, squeezing the life out of the victim if it be but a small one, or if large at least bringing it to death the sooner through useless exhausting struggles. And again the digestive glands pour out their corroding juices.

Most numerous of all the carnivorous plants are the bladderworts, or *Utricularias*. Unlike all the other plants so far mentioned, the bladderwort catches its prey under water, and hence depends less on insects than on small swimming crustacea, which are tiny relatives of lobsters and shrimps, on minute worms, on insect larvae that live in the water and on other small swimmers of that general ilk.

The bladderworts have the most elaborate trap mechanism employed by any of the carnivorous plants. Many scientists have spent much time trying to puzzle out just how it works, but it remained for Prof. Lloyd himself to find out by his own researches the whole secret of its ingenious and complicated mechanism.

Bladderworts grow either in very wet, boggy soil or actually floating in the

water. Above water they have leaves and really attractive flowers, usually yellow. All is sweet and serene there; their piracy is all submarine.

Below water they have stalks bearing finely branched, leaflike organs. Distributed over these are many tiny green round or oval bladders, flattened on one side, and usually with projecting branched thread-like processes. These latter may serve to guide the swimming prey to the fatal door that is on the flattened side.

That door was long the riddle of scientists, each of whom contributed his discovery, or sometimes just his guess, towards the final solution of its mechanism. The door consists of a more or less semicircular piece of plant tissue, fastened by its flat side to the top edge of the opening. Its free edge rests against a bolster or cushion within, which is lubricated by a mucilaginous secretion.

Weatherstrip Seal

It is sealed on the outside by a sort of weatherstrip of thin plant skin material, which keeps the outside water from any chance of entering. The discovery of this weatherstrip and its function was the contribution of Prof. Lloyd.

The door is set on a kind of trigger-latch arrangement, which keeps it closed unless the outer end of the trigger is pressed by something outside, but lets it swing clear of the inner bolster when the proper touch comes.

The whole bladder is under tension, that is, by a special excretory arrangement within it enough water has been removed so that the pressure inside is less than the pressure outside. If therefore anything jars the door open the least crack, the outside pressure will push it in violently, as a windstorm blows in a house-door. And anything outside it will be pushed in too, just as a fugitive from a storm is blown into the house along with the door.

That is exactly what happens when some small swimming beastie trips the trigger-latch. The door pops inward, the water swirls in, carrying the little victim with it. By the time he can get his bearings again and attempt escape, the door is already closed. Then the excretion of water begins again, and soon the trap is under tension once more and set for pulling in the next victim that touches the fatal trigger-latch.

This article was edited from manuscript prepared by Science Service for use in illustrated newspaper magazines. Copyright 1933, by EveryWeek Magazine and Science Service.

Science News Letter, August 12, 1933

PLANT PATHOLOGY

Watch For Disastrous Dutch Elm Disease

TREE LOVERS everywhere are called upon by the U. S. Department of Agriculture to examine their elms for any signs of the Dutch elm disease, an outbreak of which has just been discovered in New Jersey.

This new epidemic infection is in the vicinity of our largest seaport and is in an area where the elm is one of our most important trees, and it is also feared that the disease may be present in other localities from which it has not yet been reported.

Watch for wilting or yellow or brown leaves accompanied by brown streaks in the young wood. When such cases are found, cut pieces of the infected twigs as big as a lead pencil and send them to the Dutch Elm Disease Laboratory, care Experiment Station, Wooster, Ohio. There are other diseases with the same symptoms and the cause of the trouble can not be definitely diagnosed till the specimens have been cultured. Ruthless destruction of diseased trees is the only safe procedure recommended by the experts. Not enough is known about the life history of the fungus to allow any other method. Widespread damage to elms has been caused by the disease since it was first discovered in 1920 in Holland, whence it spread to Belgium, France, Germany and England.

Sixty-nine infected trees have been found scattered among the elms of a 150 square mile area in Essex, Hudson and Passaic counties of New Jersey. The Public Works Administration has authorized the U. S. Department of Agriculture to expend up to \$80,000 to combat the disease.

Science News Letter, August 12, 1933

ARCHAEOLOGY

Old Rock Writings Discovered in Oregon

IN AN ISOLATED area of Lake county, Oregon, on the meandering line of an ancient lake so inaccessible that it can hardly be reached on foot or on horseback, the oldest rock writings known in the Pacific Northwest have been discovered. This is the announcement of Dr. L. S. Cressman, Oregon state university ethnologist.

The rock writings are of that type known to students of ancient tribes as

petroglyphs. Once deeply engraved on basalt cliffs overlooking a lake, these rock writings have been obliterated in places by centuries of weathering. The writings were found scattered along miles of cliffs, on sheltered slopes.

In one place petroglyphs were found that had been covered with pictographs, that is, the rock carvings had been traced with paint.

It is believed the rock writings in time will enable students of aborigines of western America further to trace the migration of tribes and may prove of value in the work of charting the trails of ancient man following the immigration of Asiatic peoples to the North American continent.

Science News Letter, August 12, 1933

CHEMISTRY

Rubber Varnish May Aid Tire Repair

TIRE REPAIRING and protection may be improved by the new German process of painting newly developed rubber varnishes on worn tires to protect them against heat and wet weather.

The varnishes are prepared by heating fatty oils such as castor oil with 3 to 8 per cent. of sulfur and the sticky elastic product is then applied to the worn spots. As the liquid passes into the solid state it coagulates into a rubber-like solid which is highly resistant to friction.

Science News Letter, August 12, 1933

CHEMISTRY

Artists' Crayons Made From Oat Hulls

ARTISTS' crayons from agricultural wastes are a possibility as the result of recent studies at Iowa State College.

By treating furfural, an oily yellow liquid made from oat hulls, with various simple chemicals, a black material suitable for artists' crayons has been made. Tests show that crayons made from the new material are satisfactory in actual use in comparison with charcoal.

By varying the chemical treatment given the furfural, crayons of varying degrees of hardness and blackness may be secured—a thing impractical with charcoal but desirable from the artists' standpoint.

Science News Letter, August 12, 1933

IN SCIENCE

ASTRONOMY

Falling Stars Brightest In Electrified Layer

THE PATHS of falling stars are brightest at a height of about ninety kilometers, just below the lowest electrical roof of the world, according to the calculations of V. Malzev of the Tashkent Astronomical Observatory, U. S. S. R., communicated to *Nature*.

Fireballs, too, occur at about the same height, according to numerous observations, and within the same region have been observed the peculiar luminous night clouds, rather like "cirri" in appearance, which have been noted at rare intervals.

The connection between these luminous phenomena and the electrical region of the upper atmosphere below which they seem to occur will no doubt form the subject of further inquiries by scientists.

Science News Letter, August 12, 1933

SEISMOLOGY

Earthquake Increases Size Of California Lot

APRINCIPAL street of Los Angeles, Ocean Avenue, had its width between curbs widened 6 to 8 inches by the earthquake of March 10 while 11-inch cracks were opened in side streets.

These geological changes are reported to have occurred in the sandy spit between Alamitos Bay and the Pacific Ocean, an area roughly 1½ miles long and 400 to 900 feet wide. Previous reports of the earthquake have not accented changes of such magnitude. It is estimated that the sandy spit was widened by the quake four feet in a number of places.

A man living in this area measured his lot and found to his apparent pleasure that it was 1½ feet longer than before the shake.

Four extra feet of pipe were necessary in repairing water pipes along typical cross streets. Nevertheless little damage was done to houses in this area.

Science News Letter, August 12, 1933

EE FIELDS

ENTOMOLOGY

Perfume of Female Moths Lures Males to Betrayal

EVER SINCE the Philistines used the wiles of the beautiful Delilah for the entrapment of the strong but not-too-clever Sampson, crafty men have played the same game for the betrayal of the males among their enemies. Now the ancient trick is being used on insects; in a technical bulletin of the U. S. Department of Agriculture, C. W. Collins and S. F. Potts tell how.

The objective is to discover new infestations of the gipsy moth, whose caterpillars have for years been exceedingly destructive to New England shade and forest trees. It is desired to find new small colonies in the regions outside the main infestation.

The trick is done by baiting insect traps with an extract made from the bodies of unmated female moths, which has a scent imperceptible to human nostrils but powerfully attractive to the males of the gipsy moth tribe. They have been known to fly for more than two miles to reach one of these treacherous love-potions.

The scent is manufactured from the bodies of female moths in New England, where they are numerous, and the traps are set up in districts suspected of harboring new infestations. If male moths appear in the traps, the entomologists search the neighborhood until they find the infested spot. Then they go to work with poison sprays until they have wiped out the whole colony.

Science News Letter, August 12, 1933

PHYSICS

Physicists Seek Single Electron Acting as Wave

A GOAL of physics just now is to discover one single electron acting as a wave.

To clarify some of the latest enigmas of the most advanced knowledge of our physical world, Profs. P. I. Kapitza and P. A. M. Dirac, theoretical physicists at the University of Cambridge, have appealed to fellow experimental physicists

to perform a crucial experiment, that of passing a beam of electrons through a double beam of light.

Frankly they do not know how the experiment can best be done and they can only hope for success.

Since Prince Louis de Broglie, the French Nobelist in physics, showed that electrons have wave characteristics and Dr. A. Heisenberg, the young German physicist, stated that absolutely precise simultaneous measurements of both the position and the momentum of a particle were impossible, physicists have been inquiring into the behavior of individual electrons. These experiments have always shown an uncertainty in one of the fundamental quantities measured.

The new scheme suggested by Profs. Kapitza and Dirac is to let a green light shine on a perfect mirror and be reflected straight back. The superimposed waves of light will form a periodic field through which electrons will be shot at a definite speed. This field is expected to act on these electric particles which may also be considered as waves and bend them slightly.

It is hoped that the interference of the light wave field and the electron wave field will produce a pattern on a screen or detecting device. Scientists reading this pattern may acquire new conceptions of the behavior of single electric particles.

Science News Letter, August 12, 1933

ENGINEERING

Cold Process May Eliminate Picturesque Rivet Catcher

THE PICTURESQUE profession of catching hot rivets may disappear among steel workers.

Cold-driven rivets instead of heated rivets make the seals on the new 10,000,000 cubic foot gas-holder built for the Philadelphia Gas Works.

The ordinary practice is to heat the rivets to a cherry-red and pound the point into a second head after it is placed in a hole through two pieces of steel. On cooling, the rivet contracts, drawing the steel plates together. It is now found that cold rivets with small heads can be hammered into position tightly enough to make a seal.

The rivets driven in this manner have a greater tensile strength and will withstand a greater shearing force. The elimination of the labor of heating and catching the hot rivets is an additional advantage.

Science News Letter, August 12, 1933

MEDICINE

Artificial Heart Aids Blood Transfusions

BLOOD transfusions may be carried on more rapidly and conveniently than in the past, through the use of a new electrically driven "artificial heart" which is interposed between the blood donor and the receiver. The "heart," which is the invention of a Paris surgeon, consists of a small rotary pump which gives the transfused blood a "boost" with impulses simulating those of the natural pulse.

Among other advantages claimed for the device is the elimination of chemicals which are frequently added to prevent clotting in the older type of transfusion operation.

Science News Letter, August 12, 1933

FISHERIES

Clams "Doped" to Make Shucking Process Easier

DOPING clams before shucking them makes the shucking process easier. Not necessarily for the clams, but certainly for the workmen who do the shucking. For it causes the mollusks to open their shells so that the shuckers do not need to pry them apart with violence.

A new process of narcotizing clams has been worked out at the Beaufort, N. C., station of the U. S. Bureau of Fisheries by Dr. Herbert F. Prytherch and Dr. Vera Koehring, who recently developed a similar process to simplify and speed up the oyster shucker's task.

Clams, the two fisheries scientists report, were more obstinate about opening their shells than oysters, but finally yielded to a treatment which involves immersion in warmish water at a temperature of 105 degrees Fahrenheit, followed by the addition of a dilute solution of carbon dioxide or of various weak organic acids. This treatment brought about the relaxation of the strong muscles that hold the clamshell shut, leaving the bivalves gaping and defenseless before the attack of the shuckers.

This treatment does not kill the clams, but merely puts them in a narcotized and relaxed state. If for any reason it is desired to keep them unshucked a while longer, they can be restored quickly merely by putting them in cool sea water.

Science News Letter, August 12, 1933

HYGIENE

Keeping Cool in Hot Weather

Ten Pertinent Suggestions On What to Do And Not
To Do in Order to Live Enjoyably During the Summer's Heat



COOL DRINKS

DRINK your cold beer or your iced tea or lemonade slowly. Don't take your cooling drinks too cold. A quantity of cold food or drink taken into the stomach quickly may interfere with digestion and cause you some distress. Moderation in the temperature of your food, in the amount you eat and drink, and in the speed with which you imbibe it is a wise procedure, summer or winter.

HATS

THE PANAMA hat is the coolest headgear you can wear. Tests showed the air was twenty degrees cooler inside this hat on a sizzling summer day. Besides keeping off the direct heat rays of the sun it permits a ventilation of the enclosed space between the hat and the head. The ordinary stiff straw is nearly as cool, but if you don't wear straw, choose a soft felt in preference to the close fitting cap.



EVAPORATION

COOL off with cold baths—as cold as you can stand—and finish the job by drying off without a towel. When water evaporates from the skin it takes the heat with it, producing a true refrigerating effect. That is why perspiration helps to cool you. But keep out of drafts when your body is wet, especially if your underclothing is wet from perspiration, to avoid rheumatic pains.

INTOXICANTS

IF YOU FEEL faint during the hot weather, lie down or sit down at once. This will relieve your heart from strain. But don't take whisky or brandy for this faintness. Cold water on the face is safer and more effective. Call a physician if you don't get relief. If heat has made you faint before, you are likely to suffer when the next hot wave comes, so spend the hottest hours resting if possible.



POROUS CLOTHES

LOOSE, coarse-meshed porous clothes are the smart thing to wear in hot weather. For such clothing allows ventilation of the skin and ready evaporation of the perspiration which cools the body. Close clothing keeps a hot humid layer of air in contact with the skin. In hot weather the chief protection of the body against a rise of body temperature and a heat stroke is the cooling that comes from the evaporation of the perspiration. Anything that promotes this evaporation, such as currents of air, helps to keep the body temperature from rising. Hence the value of loose porous clothing.

SALT

A SMALL pinch of salt in your glass of water will help you fight the heat if you must do hard muscular work in very hot weather. The extreme perspiration at such a time drains so much salt from the body that exhaustion may result. This loss of salt is said to be the cause of heat cramps suffered by miners, steelworkers and stokers who must work at high temperatures.

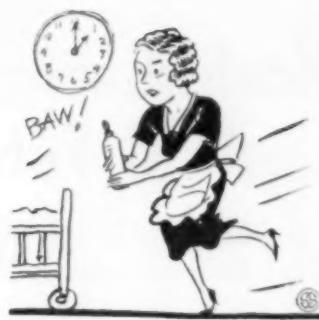


CHILDREN

REMEMBER that babies and children feel the heat too. They should be fed regularly, summer and winter. But in hot weather don't force them to eat when not hungry. They should not be overdressed. Keep them as quiet as possible during the hot spells. Special care to keep baby's milk fresh and pure will prevent much sickness and distress.

COLD WATER

FOR A QUICK cool-off on a hot day, dip your arms up to the elbows in cold water, the running water from a faucet, for example. All the blood in your body runs through your forearms in a few minutes. So if the water is cold, you can quickly cool down the body by this simple procedure.



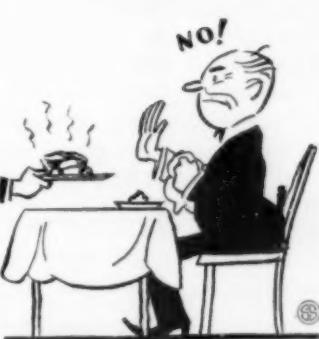
SUMMER COLD

IN YOUR EFFORTS to keep cool, don't catch cold. For the summer cold is as uncomfortable as the winter gripe and almost as dangerous, health authorities point out. Light clothing is fine for the dog days, but don't go on wearing it when they are over and don't scorn a wrap on a cool evening. Keep out of drafts when the underclothing is soaked with perspiration.



DIET

EAT LIGHTLY for greater coolness in hot weather. Food is the fuel that heats your body from within. Cut down particularly on the protein foods, which are the most heating. Chief protein foods are meat and eggs.



CHEMISTRY

New Method of Cheap Zinc Plating Developed

A COMMERCIAL process for plating zinc on metals that may make zinc plate cheaper than tin plate has been developed by Sherard Cowper-Coles, inventor of the sherardizing process for making iron and steel rustless.

The product has a grayish, smooth appearance as contrasted to the shiny

brightness of the familiar tin can. It is claimed that it will not rust or corrode even at a roughly cut edge. This property would make it extremely valuable for motor car fenders as the zinc plate would take the place of the priming coat of enamel.

Standard size sheets of steel can be plated by sending them through electrolytic baths on rollers. Bars of zinc metal dip into the bath and form the

positive pole of the electric circuit. With this mass production scheme in operation it is claimed that the cost of production is less than for tin plate mainly because zinc is cheaper than tin.

The process can be extended to brass and copper plating with only the appropriate changes in the anode materials and the electrolytic solutions.

Science News Letter, August 12, 1933

FORESTRY

Experiments Cast Doubt On Orthodox Forest Creed

STRIPPING off the forest cover does not decrease the water which can be obtained from a given area of land; contrary to widely accepted beliefs, it actually increases the water yield. This disagreement with orthodox forestry creed is presented by W. G. Hoyt and H. C. Troxell, hydraulic engineers of the U. S. Geological Survey, as the result of experiments which have been conducted in two typical watersheds in the West, one of which was deliberately deforested, while the other lost a chaparral cover accidentally through fire.

By measuring the water yields before the forest cover was removed, immediately afterward while the ground was still bare, and through several subsequent years while the areas were growing up in brush, a considerable mass of comparative data was accumulated.

The total annual run-off from both sample areas was increased, 15 per cent. in the case of the cut-over forested area and 29 per cent. from the burned-over chaparral area. This is considered evidence that forests and brush do not "conserve the water supply." One very important factor in the reduction of water obtainable from a forested area, the two engineers hold, is the loss of great quantities of water through evaporation and transpiration.

The increased run-off was not confined to sudden destructive flood periods, Messrs. Hoyt and Troxell state, as the summer low-water flow was increased on one area 12 per cent. and on the other area 400 per cent. It was true, however, that the loss of vegetation did increase normal flood heights.

Messrs. Hoyt and Troxell conclude, on the basis of these and other facts learned from the two areas studied that reforestation to increase the annual yield or low-water stream flow will have an opposite effect. (Turn Page)

They hold that a change should be made in the concepts to be implied by the term, "watershed protection," maintaining that undue and, in the main, erroneous emphasis has been laid on the value of timber growth for "increasing water supply," "securing favorable conditions of flow," and "promoting and protecting navigation." They emphasize their belief that where watershed protection means "retarding erosion," "conserving soil," or lessening torrential run-off it may be obtained as well by a cover of shrubs or grass, which may use relatively little water as well as by trees which may consume large amounts of water.

Science News Letter, August 12, 1933

EXPLORATION

Expedition Plans to Move Starving Islanders

ATWO MAN exploring expedition that will attempt to save 200 starving people and study for science the little visited Tristan da Cunha island group in the South Atlantic ocean will leave London soon.

The objective of the expedition, consisting of Francis K. Pease, age 27, and Edward B. Marsh, age 21, is the island group consisting of Tristan, Inaccessible, Nightingale and Gough islands. These lie about halfway between the Cape of Good Hope and Buenos Aires.

When it sails from London within the month, the auxiliary steam schooner *Sailam* will carry a ton of supplies for some 200 islanders on Tristan Island who are believed to be nearly starving. The soil of the island is becoming exhausted and the two explorers will attempt to move the population to Inaccessible Island where there is virgin soil.

Messrs. Pease and Marsh will remain on Tristan Island for two years with only a few contacts with the outside world. They will make an intensive scientific study with particular attention to the meteorology. The group of islands are important meteorologically because they lie in the open sea in a position between the poles of the earth.

Science News Letter, August 12, 1933

The tigon is a hybrid animal, offspring of a lion and a tiger.

Production of 1,000,000 tons of sugar annually from wood is projected in a research report to the Swedish Government Forestry Commission.

ENGINEERING

World Energy Estimates Quell Fears For Future of Mankind

Harvard Chemist Evaluates Sunshine, Wind, Tide and Ocean Heat as Energy Sources When Natural Resources Fail

AMPLE ENERGY for mankind's future use is contained in the sunshine, wind, tides and ocean heat. This is the conclusion of Dr. Arthur B. Lamb, professor of chemistry at Harvard University and director of the university's chemical laboratories.

Each year the world uses 17,800,000,000,000,000 kilogram-calories or as much energy as is contained in 2,700,000,000 tons of coal; if our supply of natural resources were cut off, it would take the labor of 11,000,000,000 men—5 times the population of the world—to furnish the same amount of energy.

Half Energy From Coal

At present, only 17 per cent. of this total is actual human energy while coal furnishes 50 per cent. and the remainder comes chiefly from oil, wood, gas and the labor of domestic animals.

Even these present sources of energy represent but a small fraction of the available supply of coal, oil and gas. The untapped reserves of these three natural resources amount to 2,200 times the world's annual consumption of all kinds of energy, that is, at the present rate of consumption, we can get along for a couple of thousands of years.

But this assurance, pleasing as it may be, is insignificant beside the tremendous stores of energy in sources as yet unutilized. Annual solar energy to the earth totals almost 42 times the energy of all the world's energy reserves in the forms of coal, oil and gas.

Energy on Boston

If, for example, all the light energy that falls on Boston's 43 square miles could be converted into power, the output would surpass the total present output of power in the United States. Even the common winds, if harnessed, could deliver in one year 75 per cent. as much energy as could all coal, oil and gas sources during the next 2,000 years.

Another important source is the heat of the earth which would yield millions of times as much energy as all present

sources but which, unfortunately, probably will not be tapped. Dr. Lamb points out that proposals to sink deep shafts into the ground and use the subterranean heat to generate steam are not feasible.

"Simple calculations show this is quite out of the question," Dr. Lamb declares. "The only hope is to take advantage of the accidental supplies of hot water, or better, of superheated steam occurring in certain volcanic regions, such supplies, for instance, as Count Conti has utilized with conspicuous success in Italy and which can doubtless be utilized in Sonoma County, California."

Other sources draw Dr. Lamb's attention. One possibility is the fuel cell which uses carbon or carbon monoxide as one depolarizer and the air as the other. At 1,500 degrees Fahrenheit, these cells deliver large supplies of energy and their use, at room temperatures, is not out of the question.

Energy From Rainwater

Another source is rainwater. The annual yield of rain water in the clouds would, if harnessed, be sufficient at the present rate of energy consumption to satisfy all demands for the next 150 years.

Still other sources are being examined

SEEDS

an address by

Dr. John T. Buchholz

Of The University of Illinois



To be given Friday, August 18, at 1:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting system. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

at present. Georges Claude is engaged in an attempt to utilize ocean heat economically. Tidal energy has been sought on a large scale, the most important current proposal being the Bay of Fundy plant which would yield over a half billion kilowatts. The photoelectric cell, still in its infancy as a commercial proposition, is expected to add further to this enormous store of energy which may some day entirely relieve mankind of the necessity of providing for its own economic welfare.

Science News Letter, August 12, 1933

CHEMISTRY

Unpleasant Smell of Rubber May be Eliminated

THE PECULIAR odor of rubber goods may be diminished by the addition of certain chemicals.

Drs. H. P. Stevens and E. J. Parry, research chemists for the British Rubber Growers Association, have found that the addition of zinc carbonate will counteract the odors produced by nitrogen-containing quickening agents or accelerators used in the process of manufacture.

Rubber raincoats have a distinctive smell that is due to certain petroleum and coal-tar products used in their manufacture, and the less pronounced odor of solid rubber articles is derived from the sulfur used in the vulcanizing process. Steaming the finished goods has been found to be a useful temporary remedy, but permanent removal of the smell can only be effected where pure latex and pure materials have been employed.

Odorless rubber would be extensively used for lining food containers, vats and rubber hose used by brewers, and for other purposes from which it is at present excluded.

Science News Letter, August 12, 1933

The Front Cover

THIS IS a moonlight photograph of the 400-watt electric lamp on the top of Mt. Washington. When flashed recently in visibility tests conducted by the Mt. Washington Polar Year observers, it was noticed as far away as Boothbay Harbor, Me., 95 miles distant, and at many other points in New England.

Current for the light was supplied by a portable gasoline power plant.

MEDICINE

Acid Stomach in Old Age May Be Index to Long Life

VERY ACID condition of the stomach seems to go with youth and when found in old age is an index to a long life, it appears from a study reported by Drs. Zachary Sagal, Jerome A. Marks and John L. Kantor of New York City to the American Gastro-Enterological Association and published in *Annals of Internal Medicine*.

These physicians made 6,679 determinations of the amount of hydrochloric and other acids in the stomachs of nearly that number of patients having symptoms of digestive disorders. The patients were of all ages and came from many different walks of life. Here are some of the other interesting findings of this study, some of which confirm observations by other scientists:

There are several constitutional types with regard to gastric acidity, as well as with regard to other conditions.

After constitutional predisposition, age is the dominating factor in gastric acidity. The greatest percentage of high stomach acidities was found in the fifth decade of life. This is the period when all bodily functions begin to decline, including stomach secretion, Dr. Sagal and associates pointed out. Diminishing amount of acid in the stomach may be considered one of the indications of approaching old age, such as loss of hair and teeth, diminishing activity of the glands of internal secretion and hardening of the arteries.

Sex is also a factor, men having higher degree of stomach acidity at all

ages than women.

Certain diseases are known to be associated with certain ranges of stomach acidity; for example, the acidity is high in duodenal ulcer, while hydrochloric acid is absent in pernicious anemia and cancer of the stomach. These acid levels seem to precede the disease, however, and Drs. Sagal, Marks and Kantor believe that the degree of acidity, which is a constitutional factor, predisposes to a certain disease, rather than that the disease produces the change in acidity.

Regular determinations of the acid in a person's stomach, therefore, are recommended in order to watch for predisposing signs of disease, and also as a guide to treatment.

For example, persons with a tendency to have too much acid in the stomach should avoid spicy and other foods that stimulate stomach secretion. Low acidity, on the other hand, calls for an entirely different diet.

In many cases of heartburn the New York doctors found little or even no acid in the stomach, and they point out that medicinal treatment should be guided accordingly. It would seem that baking soda, favorite home remedy for heartburn, may be all wrong in some cases. If the condition in a given case were due to too little acid, the soda, by neutralizing what acid there was in the stomach, would exaggerate the condition and aggravate rather than relieve the symptoms.

Science News Letter, August 12, 1933

CONVENIENCE COUPON

for New or Renewal Subscription to Science News Letter

Send this coupon to Washington while you are thinking of it.

Science News Letter,
21st and Constitution Avenue,
Washington, D. C.

Please start renew my subscription to SCIENCE NEWS LETTER. I am enclosing remittance as checked: 2 years, \$7 1 year, \$5

Name
Street
Address
City and State

If this subscription is a renewal, check here

ENGINEERING

Mapping of Nation Speeded By Public Works Allotment

MORE THAN \$5,000,000 of the federal public works money will be spent in mapping and surveying of the country and its waterways with resulting benefits to reviving industry, agriculture, shipping, and mining now and in the future. While this money will speed the eventual completion of the country's mapping, much of it will be used for wages and will be spent locally in communities widely scattered over the United States.

The allotment of \$2,600,000 public

works money to the Coast and Geodetic Survey of the Department of Commerce will enable the Department to proceed with scientific work of surveying the nation's coast lines and the making of triangulations and elevation measurements in the interior of the country.

With regard to mariner's charts, the situation in respect to intracoastal waters of the Atlantic coast is particularly bad. Secretary Roper has pointed out that most of the surveys of these waters were made 30 to 50 years or more ago. Since

that time both the forces of nature and the works of man have made radical changes in many sections.

New charts based on new surveys will become of increasing importance with the expected increase in commerce and transportation.

The money will also prevent the suspension of the Survey's earthquake studies in California.

No action has been taken as yet on Secretary Roper's request for public works funds for testing work at the National Bureau of Standards in connection with the recovery program.

The U. S. Geological Survey in the Department of Interior is another scientific agency of the Government which has secured relief for severe curtailments in funds through new allotments from the public works funds. In addition to the \$1,200,000 which was recently allotted to this survey for construction and repair work, another allotment of \$2,500,000 has just been announced.

Most of this sum will be used for topographical survey work, which will employ the service of a great many engineers and technical employees. But it is understood that it will not relieve the situation for the scientists of the Survey. A small part of the allotment, \$100,000, is to be used for investigation of underground water resources, and this work will employ some geologists and chemists. No public works funds have as yet been assigned for the geological work of the Survey. Secretary Ickes had previously decided, however, not to dismiss the geologists slated to go because of lack of funds for salaries. Instead he instituted a system of staggered furloughs so that the Survey can have the benefit of their expert advice at least during part of the time.

Science News Letter, August 12, 1933

BOTANY

Weed Cultivated To Make Lawns

THE CANNY old counsel, "If ye can't lick 'em, jine 'em," has been applied to good effect in St. Louis. A number of excellent lawns have been developed in that city, in which no grass is used at all, but instead the common weed yarrow or milfoil. This may have been suggested by the Old-World practice of growing "scented lawns" of the chamomile, a plant somewhat related to yarrow and resembling it in its growth habits.

Science News Letter, August 12, 1933

As a birthday or other friendly
gift of remembrance:

What to Give?

at \$1

A 17-week trial
subscription to Sci-
ence News Letter

at \$5

A one-year sub-
scription to Science
News Letter

at \$7

A two-year sub-
scription to Science
News Letter

Please use the Coupon below

No extra charge for postage to any address in the world

To SCIENCE NEWS LETTER
21st and Constitution Avenue,
Washington, D. C.

Please enter the following 17 weeks 1 year subscription to SCIENCE NEWS LETTER.
 2 year

I enclose remittance (or, bill me later):

GIFT TO

Name

Street Address

City and State

My Name and Address

My Name

Street Address

City and State

ENGINEERING

New U. S. Submarine's Hull Joined Together by Welding



ENTOMOLOGY



Chalcis Fly

MANY of the winged pests that make themselves man's unbidden and unwelcome guests are all the more troublesome in that they choose for their feeding the very things which man himself most values.

Among these one of the most troublesome is a species of tiny insect known as the clover-seed, or alfalfa-seed chalcis fly. Its size may be gauged from the fact that it spends all of its pre-adult period of growth inside the tiny seed of clover or alfalfa, and when it finally emerges as a full-grown adult it is still smaller than its cradle.

The female drives her sharp ovipositor through the tiny pod of the clover seed when it is still soft and green, and lays an egg in the developing seed. The microscopic grub that hatches feeds on the rich, juicy tissues of the seed, reducing it to a hollow shell. Then it curls up for that mysterious sleep of metamorphosis through which many insects pass, resting for a time as a pupa. During this period the infantile tissues and organs of the larva disappear completely, and those of the adult develop. At last the insect gnaws its way out of the ruined seed to freedom—and a repetition of the vicious circle.

Since odds and ends of unreaped clover or alfalfa harbor the pest from autumn until spring, farmers are urged by the Department of Agriculture to cut their crops as close and clean as possible, to turn over all fence lines and waste places, to cultivate fields late so that infested seeds may be buried, and above all not to let a badly infested field stand without cutting just because the crop can not be used, but to clean these even more thoroughly than those only a little afflicted with the pest.

Science News Letter, August 12, 1933

THE U. S. SUBMARINE *CACHALOT* now under construction at the Portsmouth Navy Yard has several remarkable features.

For the first time the sections of the hull of a submersible have been joined by welding. These hull sections themselves are the largest ever used in the construction of underwater craft. With one or two possible exceptions they are the largest ever used in marine construction in this country.

Submarines must be built to withstand the terrific pressure underneath the surface. There the ocean throws its forces in to crush the adventurer. The ship must also bear the buffets of orthodox surface cruising.

In the *Cachalot* an exacting problem was set for the naval construction corps. Overhead welding must be eliminated. The hull plates were shipped from the mills in great strips about 24 by 14 feet, weighing nearly 4 tons each. They were pickled and washed to remove the mill scale, then squared, and laid out for drilling in the shipfitters' shop.

Authorities call the *Cachalot* the most nearly "shop built" of all the submarines. Skill was required to prepare each piece in such a way that little extra fitting was required on the ways. Tests were made and it was found that the maximum error from a true circle at two stations was one-eighth of an inch and at others but one-quarter of an inch.

The same major features were used in the building of the *Cuttlefish* at a pri-

GEOLOGY

Scientists to Identify Unprofitable Lands

TO FACILITATE recognition of lands of doubtful productivity so that they may be removed from further fruitless attempts at cultivation is one of the objectives of a new committee of the National Research Council. Its division of geology and geography has appointed a committee on land classification that will study the methods now in use. Prof. K. C. McMurry of the University of Michigan is chairman of the committee.

Science News Letter, August 12, 1933

vate yard in Connecticut.

It is believed that such an advance in methods means greater safety of the boat and it is certain that for large scale construction thousands of dollars may be saved over the old system of rivets.

Both *Cachalot* and *Cuttlefish* will be equipped with the "lung," the submarine escape appliance. This odd apparatus, looking something like a gas mask, is fastened to the mouth and nose of a person wishing to escape from a wrecked submarine. It supplies air for a long passage through the open water.

Further safety for the crew is supplied by two marker buoys. These big steel floating balls can be disengaged from inside the hull. They rise to the surface carrying an insulated radio aerial and a telephone. The latter is reached by opening a plate in the top of the buoy and with it communication can be maintained with the trapped crew.

Science News Letter, August 12, 1933

FORESTRY

Tanks Fight Fires In California Woods

TANKS, not the military kind but real tanks full of water mounted on powerful, pump-equipped trucks, have revolutionized methods of fighting forest, brush, grass and grain fires in California. There are now over 200 tank-truck fire-fighting units in the state; the state forestry department alone operates 36 of them.

A typical fire-fighting tank truck can carry 400 gallons of water into a dry area where a fire is going, and can reach a maximum road speed of 45 miles an hour. It is equipped with hoses and nozzles for its work when it arrives on the scene of action, and it can also supply men with small tanks strapped to their backs with the few gallons each they need when climbing into inaccessible corners to fight small fires hand-to-hand.

A full description of the new equipment, by Woodbridge Metcalf, extension forester of the University of California, is published in the *Journal of Forestry*, official organ of the Society of American Foresters.

Science News Letter, August 12, 1933

•First Glances at New Books

Chemistry

TWENTY-FIVE YEARS OF CHEMICAL ENGINEERING PROGRESS—Edited by Sidney D. Kirkpatrick—*Van Nostrand Co.*, 387 p., \$4. Authorities in the various fields of chemical engineering summarize the recent progress in the application of chemistry to industry. The advances that have resulted from the impact of chemical science upon industry make interesting reading and they should inspire larger attention to the contributions of science attainment to national and world recovery. This volume is issued in connection with the silver anniversary of the American Institute of Chemical Engineers.

Science News Letter, August 12, 1933

Exploration

FOUR YEARS IN THE WHITE NORTH—Donald B. MacMillan—*Hale, Cushman & Flint*, 428 p., \$3. Third printing.

Science News Letter, August 12, 1933

Economics-Engineering

COMMON SENSE ABOUT MACHINES AND UNEMPLOYMENT—Morris P. Taylor—*Winston*, 173 p., \$1.50. Technology as it impinges upon economics is discussed in this book. The author points out that we can draw two conclusions from the late-lamented new era. "First, small discrepancies between the value of the products of industry and the purchasing power of the bulk of the community can have extreme consequences. Second, since the original discrepancies are relatively small, we should be able to correct them by intelligent effort."

Science News Letter, August 12, 1933

Physics

PHYSICAL MECHANICS—Robert Bruce Lindsay—*D. Van Nostrand*, 436 p., \$4. A new text of intermediate grade for students of the physical sciences, written by the associate professor of theoretical physics at Brown University.

Science News Letter, August 12, 1933

Education

AN ORIENTATION COURSE IN EDUCATION—Joseph S. Butterweck and J. Conrad Seegers—*Houghton Mifflin*, 392 p., \$2. A book for prospective teachers. Of science and the machine age, the authors say: "Science is truly remaking the world; the world of thought and the world of action, the world of education and the world of regulation and punishment, the world of play and the world of labor, the

world of religion and the world of physical health. And the end is not yet. Anyone born into such a world must be educated, above all things, to adapt himself to change and to help direct the course of the change. No longer will the authoritative acceptance of truth concept of education suffice, for we too must inquire, 'What is truth?'"

Science News Letter, August 12, 1933

Astronomy

STELLAR WONDERS—Charles Whyte—*Sheldon Press*, 196 p., \$1.75. Popular astronomy originally prepared for broadcasting in Great Britain. An adequate first introduction to the universe of stars, planets and nebulae that confines itself largely to the objects that can be seen in the sky and does not enter into the realm of universe theories.

Science News Letter, August 12, 1933

Public Health

EPIDEMIOLOGY IN RELATION TO AIR TRAVEL—Arthur Massey—*H. K. Lewis, London*, 59 p., 7s. 6d. Here is a brief but intensely practical book on a subject which has become one of the most recent public health problems. Public health and air line officials will be particularly interested. Maps showing disease zones and lines of air travel, and a table comparing the incubation period for yellow fever with air and sea distances between yellow fever areas and other points add to the practical value of the book.

Science News Letter, August 12, 1933

Psychology

GENERAL PSYCHOLOGY—Gardner Murphy—*Harper*, 657 p., \$3.50. An interesting textbook with an unusually plentiful supply of illustrations.

Science News Letter, August 12, 1933

Hygiene

GROWING INTO MANHOOD—Roy E. Dickerson—*Association Press*, 100 p., \$1. A book on sex education for boys between 12 and 15, endorsed by the Young Men's Christian Association. It is simply written in direct matter-of-fact style and should fulfill its purpose satisfactorily.

Science News Letter, August 12, 1933

Engineering-Medicine

STOP THAT SMOKE—Henry Obermeyer—*Harper*, 289 p., \$2.50. Written in non-technical language, the smoke menace is pictured as a condition of which most of us are unaware because we are so close to it. The author contends that an emergency actually exists, that it can be overcome and that we must overcome it in the interests of economy and health.

Science News Letter, August 12, 1933

Economics-Industry

THE NATIONAL INDUSTRIAL RECOVERY ACT—Benjamin S. Kirsh and Harold R. Shapiro, *Central Book Co.*, 156 p., \$2.50. A brief volume explaining the industrial control provisions of the national industrial recovery act.

Science News Letter, August 12, 1933

Library Science

THE PRACTICAL USE OF BOOKS AND LIBRARIES—Gilbert O. Ward—*F. W. Faxon Co.*, 195 p., \$2. The fifth edition, revised and enlarged, of one of the best library manuals.

Science News Letter, August 12, 1933

Physics—Geology—Chemistry

TRANSACTIONS OF THE AMERICAN GEOPHYSICAL UNION, FOURTEENTH ANNUAL MEETING, 1933—*National Research Council*, 521 p., Free. This National Research Council publication, effectively and economically printed by lithography, is in effect a year book of American geophysics. It brings into plainest form for ready reference the papers delivered before the sections upon geodesy, meteorology, terrestrial magnetism and electricity, oceanography, volcanology, seismology and hydrology at the April, 1933, meeting.

Science News Letter, August 12, 1933

Zoology

LONDON ZOO—Gertrude Gleeson—*Robert M. McBride & Co.*, 323 p., \$2.50. Nearly as much fun as a trip to the London Zoo and not nearly so tiring. There are dozens of photographs. Typical chapter headings: Monkey Tricks; Elephants Are So Shy; The Zoo Orchestra; Nobody Loves a Sea Lion Long.

Science News Letter, August 12, 1933

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c for handling. Address: Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D. C.